Postel (Hom

Network Working Group
Request for Comments: 910

Harry Forsdick
BBN Laboratories
August 1984

Multimedia Mail Meeting Notes

Status of this Memo

This memo is a report on a meeting about the experimental multimedia mail system (and in a sense a status report on that experiment). Distribution of this memo is unlimited.

1. Introduction

A meeting was held at Bolt Beranek and Newman on 23-24 July 1984 to discuss recent progress by groups who are building multimedia mail systems and to discuss a variety of issues related to the further development of multimedia systems. Representatives were present from BBN, ISI, SRI and Linkabit. The list of attendees appears at the end of this note.

The result of this meeting is a series of agreements that will be incorporated in the next set of experiments with multimedia mail as well as a set of items for further action.

Note: There are references in this document to notes in a series devoted to multimedia mail. These notes are available on-line in the directory [USC-ISIF]<MMM> and have the names MMM-N.TXT where N is the note number. The file MMM-INDEX.TXT is a list of all of the notes in the series. These public files may be copied via FTP using the FTP username ANONYMOUS and password GUEST.

2. Review of Status

Status reports on work accomplished in the last year were given by each organization.

2.1. BBN

The initial implementation of Diamond is complete and runs on the Jericho workstation. Diamond currently supports the exchange of compound documents which contain text, graphics, images, voice and spreadsheet/charts. A demonstration of this system was presented showing both the user's view of Diamond messages and message management as well as the interactions between the components of this distributed system. Diamond currently uses the TOPS-20 implementation of MPM for inter-cluster message transport but the plan is to integrate an implementation of MPM for the Sun Workstation into Diamond. Current activity is focused on porting Diamond to the Sun Workstation. A first version of Diamond for the Sun is nearly

completed and parts (the document editor) were demonstrated running on the Sun. Diamond will be used in the ADDCOMPE testbed with 100-200 users expected in the next year or so. Future plans include building on the experience gained with Diamond in the area of multimedia conferencing, extending the use of multimedia into other application areas and applying the distributed architecture of Diamond to other application areas.

2.2. ISI

A new effort aimed at developing a user interface on a Xerox 1108 (Dandelion) workstation has just begun. All of the implementation is being done in Interlisp. Initial work has been done to implement IP and TFTP on the 1108 as well as a document editor that makes use of the Interlisp-D window system. Work on the user interface that was developed on the Perq will be cycling down. The implementation of the MPM on TOPS-20 is essentially complete with the addition of MPM to SMTP mail conversion; no major changes are anticipated. The TOPS-20 MPM will be used as the message transport facility for the 1108 user interface implementation. TFTP will be used to get messages from the 1108 to the TOPS-20.

2.3. SRI

The SRI multimedia mail system consists of three parts: The Multimedia Mail Handler (MMH) which is the user's interface for managing mail, the Structure Editor (SE) which is used to view and compose multimedia messages and the MPM for mail transport. This system is implemented on the Sun Workstation. The first release of the MPM on the Sun will be ready for distribution at the end of this summer. The SE is used to view and compose structures of multimedia objects. Currently there is support for text, voice and graphics.

Another effort at SRI involves integration of applications to run in the ADDCOMPE testbed. Diamond will be the first example of an application which uses multimedia data in the testbed. SRI is interested in examining the issues associated with multimedia systems to determine how multimedia data can be used in other applications that might be put into the testbed.

2.4. Linkabit

Linkabit has recently received a contract to work on protocol evaluation, problems associated with working in a large internet environment, and new real-time end-to-end services. They will be working with Sun workstations. Areas of interest are protocols, multimedia conferencing and domains.

3. Discussions and Agreements

3.1. Conversion to the New Multimedia Syntax

There was general agreement that in future experiments we would all adopt the revised syntax for multimedia mail as described in the Final Report to SRI Project 5363. It was agreed that RFC767 should be revised to reflect these changes. The timing for switching over should be as soon as possible and should be completed by October 1, 1984.

3.2. Graphics Representation

A wide ranging discussion on the way in which graphics is to be represented in multimedia documents occurred. It was generally agreed that the first style of graphical object to be included in multimedia messages would be a simple line-drawing, such as those that can be produced by the many "draw" programs (e.g. LisaDraw) currently in existence. Attention was focused on the two existing standards (ACM-CORE and GKS) and the interim protocol used in the Diamond system. Two major problems with the existing standards were mentioned:

- In both ACM-CORE and GKS grouping is inadequate or non-existent. This means that it is difficult or impossible to build up a composition of several graphical objects and then manipulate that composite as a single graphical object.

- Neither ACM-CORE or GKS have specified a standard method for representing graphical drawings in memory (e.g. long term file storage). This is one of the most important aspects of a graphical standard for multimedia mail. The focus of graphical standards so far has been towards driving devices in a independent manner, not storing graphics in a standard representation.

A presentation of the representation for graphical objects in Diamond was given. The protocol is documented in MMM-18 and MMM-23. Requests for hardcopies of the diagrams in those documents (sigh) can be sent to Travers@BBN.

The discussion then focused on the level of effort required to switch from one representation to another. It was generally agreed that compared to the entire editor used to manipulate graphical objects (e.g., the "draw" program), the part that reads or writes objects from or to files is relatively simple. Most draw programs have a unique internal representation which is built when reading the file representation and used as the source when writing the file

representation. It is this relatively small portion of a graphics editor which is impacted by switching from one file representation to another. Thus it seemed that the approach of adopting one interim representation now and planning to switch to a standard representation when work on the standards solve the problems noted above was reasonable.

After considerable examination of the issues, the following decisions were reached:

1. The representation for graphics used in Diamond and documented in MMM-18 and MMM-23 will be adopted as an interim representation for graphics in multimedia mail. It will be known as the MMGraphics1 protocol.

2. We will actively track development of the GKS standard and also examine a GKS-subset that has been developed by Sandia Labs.

3. We agreed to settle on an adopted international standard eventually.

3.3. Document Presentation Semantics

There was a presentation of the ideas contained in MMM-22: "A Format for the Construction of Multimedia Messages". The resulting discussion addressed the following issues:

- Presentation of documents on display devices with different characteristics (dimensions, resolutions, available fonts, etc.).

  The essence of the conversation was that there is no single set of fonts, or page sizes that will cover all of the possibilities. There was a strong feeling that as long as the display surface was of reasonable size that a document should be presented in a "correctly" formatted manner. Rather than the originator of a document specifying hard page boundaries, the intent of the originator regarding formatting and grouping of objects in the document should be preserved and used when the document is actually presented on a display device. A window on a bitmap display and a hardcopy page printer are both examples of display devices.

- The desire to represent the kinds of documents that currently exist in the world of hardcopy as well as to represent documents that can take advantage of the new possibilities of electronic creation, storage and presentation.

Several points were made:

1. One of the first goals for multimedia systems should be to represent the types of documents that are prevalent in the hardcopy world. People are already familiar with these documents and will expect multimedia systems to, at least, be able to deal with them.

2. In an effort to provide the capabilities of electronically originated documents based on the hardcopy model of documents, we should not eliminate the great potential of electronic documents that have much greater reactive qualities. For example, a document where a graphical figure and a textual explanation of that figure are linked so that as long as the explanation is being read the figure is visible.

3. In many situations being able to carry away a paper copy of a document is a requirement even if the document was not primarily intended to be presented in hardcopy.

The following agreements were made:

1. A method for recording the author's intent regarding the presentation of a document should be developed. This representation would defer decisions on final presentation bindings of size, resolution and fonts to the reader's document presenter.

   Topics addressed by this representation will include:

   - Grouping of objects
   - Limited Font attributes (e.g., normal, bold, italic)
   - Headings, Footings
   - Sectioning

   Of course the reader's document presenter is free to ignore any of the author's intentions it cannot deal with. The point of this representation is to record the author's desires but to defer final decisions on how to use the intentions until the capabilities of the reader are known.

   This representation will lie some where between the rather loose spatial and temporal positioning commands currently in the protocol (Sequential, Simultaneous and Independent) and the

absolute positioning of a system that defines rigid page boundaries and absolute positions for object placement on a page.

2. We will NOT try to make this representation handle all of the issues addressed by modern document formatting systems. Instead we will skim off some of the most useful ideas but perhaps limit the flexibility present in these complex formatting systems.

3. The document representation will be able to describe relationships between objects that make use of the capabilities of electronic document presentation, such as simultaneous presentation (i.e., two objects which are visible at the same time) and overlay presentation (i.e., two (possibly transparent) objects which occupy the same area in a document, which may also be separated under viewer control).

4. Methods should be developed for all aspects of the document representation for presenting the document in a hardcopy form. This applies both electronic documents that fit the tradition hardcopy model as well as those that make use of the more reactive features of the representation.

3.4. Directory Service

There is an increasing need to be able to determine attributes of users, hosts and domains throughout the DARPA Internet. For example, when composing the header fields of a message it is useful to be able to inquire about the mail box location of a person to whom the message is addressed. Likewise, there is need to determine the services provided by a host so that requests that will never be satisfied can be avoided.

The feeling of the group was that work on the Internet Domain system (being done at ISI and Berkeley) would answer some of these problems and that we should examine the design documents to see how that system might help us (see RFCs 882 and 883). The WhoIs server is useful, but only for information about the text mail box of a person (see RFC812).

3.5. New Media Types

The discussion dealt with three topics: A proposal for a new media type, ideas for other new media types and provisions for dealing with unknown media types.

A description of the Diamond SpreadSheet/Chart media type was presented. This is documented in MMM-24. In this media it is possible to represent a table containing numbers, labels, dates and formulas. A unique attribute of this media type is that the spreadsheet model as well as the data are transmitted. The reader of a document containing a spreadsheet object can test what effect different data would have on conclusions suggested by the spreadsheet object. A spreadsheet may appear as a table and/or one of several alternative business charts (line graph, scatter graph, bar chart or pie chart). Rulings may be added to the tabular representation so that it is possible to achieve the appearance of sophisticated tabular data presentation. During the discussion, the point was made that a minimal implementation of the spreadsheet object could ignore the formulas and just present the values of the cells, thus allowing a minimal presentation of the tabular and chart information.

Ideas for new media types included:

Form

A set of fields which are Name-Value pairs. Forms can be used for presentation and/or acceptance of information. The act of filling out a form might be used (under user approval) to trigger sending the completed form to the appropriate person who handles such forms.

Animated Graphics

A line drawing that has temporal information encoded in the presentation of its components. The idea is that parts of a graphics object could move about the object during its presentation. For example, an arrow could move about a map showing a route to be followed. There was some discussion about how this would interact with other media. For example, how could an arrow moving about a map be coordinated with voice instructions on how to get from one place to another. There were no decisions about how best to accomplish this.

Finally, we agreed that all of our systems should be prepared to accept (and possibly ignore) media types that are not currently implemented. The common way of dealing with this is to include a statement of the form "An object of type <Type> appears here". With

the regularized syntax that has been adopted many of the common attributes of all object types will be able to be understood but the actual type may not be implemented. In Diamond we would like to use the MPM to transfer Diamond messages between Diamond and non-Diamond clusters. Currently if we were to include a spreadsheet in one of these messages, all of the other implementations of multimedia mail would probably end in the debugger when they went to process our messages, rather than indicate that there was something that they didn't quite understand.

3.6. MPM Support

By the end of the summer there will be two implementation of the MPM: on TOPS-20 and on the Sun Workstation. We agreed to try to set up the following operational MPMs:

Organization	Host	MPM Implementation
ISI	ISIF	TOPS-20
ISI	ISIB	TOPS-20
SRI	?	Sun Workstation
BBN	?	Sun Workstation
DARPA	?	Sun Workstation
Linkabit	DCN6	Sun Workstation

The idea behind this agreement is to get wide geographic coverage to allow us to use multimedia mail on a regular basis and to test the impact of realistic use of multiple communicating MPMs using the Internet.

3.7. Floating Point Data Type

In the representation for data defined in RFC759, there is no way to represent floating point numbers. We agreed that a new data type should be added, called Float64 which is the 64-bit IEEE standard floating point number representation.

3.8. Captions

The idea of including a text caption as an optional property of every object was discussed. There are several uses of such a caption:

- For media like voice which do not have an implicit visual representation, it is useful to include a caption indicating something about the object. This caption can serve as a visual indication of the presence of the non-visual object.

- When an implementation of a multimedia message system doesn't support a given media type, it can be useful to give some information about the object in the form of a text passage.

- In some situations, it is important to present an outline of a document. Captions associated with each object could be used to generate a shortened abstract of the document.

We agreed to add to all object types an optional property whose name is "Caption" and whose value is of type Text String.

3.9. More Users of Multimedia Mail

We need to increase the use of multimedia mail to gain more experience with issues that need attention. This can be done by:

- Encouraging more sites to participate in the experiments. There are several possible sites which have Sun workstations that could be configured to run an MPM and one of the multimedia message systems.

- Making the MPMs perform translations to and from SMTP text-only mail. At BBN, the Diamond Import/Export component performs translations in both directions and this has proved very useful in testing the operation of our system. In addition, the inclusion of statements such as <Graphics appears here> might spark interest from text-only mail recipients, although care should be taken not to offend anybody with this kind of "class differentiation".

To the extent possible, the Sun Workstation MPM will be modified to perform translations to and from SMTP mail. The TOPS-20 MPM already does the translation from multimedia mail to text-only mail. It may be possible to add translation in the other direction.

3.10. Multimedia Exploder Mailing List

A mailing list devoted to Multimedia Mail will be set up at ISI. This will be of the "exploding" variety so that sending a message to the list will cause everybody on the list to receive a copy. To get on or off the list send a note to MMM-People-Request@USC-ISIF.ARPA. The exploder mailbox is MMM-People@USC-ISIF.ARPA.

3.11. Next Experiment

The next experiment will be in January 1985. At that time we will try to demonstrate the following new features:

- o Use of the revised multimedia syntax described in section 3.1.
- o Inclusion of Graphics objects, in addition to Text, Images and Voice.
- o Use of the, as yet unspecified, document presentation semantics described in section 3.3.
- o Use of the Sun Workstation MPMs.

4. Further Actions

Several of the agreements reached require further action. I have added dates which seem reasonable.

Revision of RFC759 to include Float64 data type.
Person: Greg Finn and Jon Postel.
Due Date: 1 September 84.

Conversion to the new Multimedia Syntax
Person: All groups.
Due Date: 1 September 84.

Revision of RFC767 to reflect revised Multimedia Syntax and optional Caption property
Person: Jose Garcia-Luna and Jon Postel
Due Date: 1 October 84.

Specification of Document Presentation Semantics (Section 3.3)
Person: Harry Forsdick
Due Date: 1 October 84.

Acquisition of GKS and GKS-subset documentation
Person: Lou Schreier
Due Date: 1 September 84

Completion of initial implementation of Sun Workstation MPM
Person: Andy Poggio
Due Date: 15 September 84

Multimedia Exploder Mailing List
Person: Greg Finn
Due Date: 15 August 84 < COMPLETED >

Addition of MPM<==>SMTP translation logic to Sun Workstation MPM
Person: Mike O'Connor
Due Date: 1 November 84

Demonstrate Text-Graphics-Image-Voice Document Exchange
Person: All
Due Date: January 85

5. Attendees

Harry Forsdick	BBN	Forsdick@BBN	(617) 497-3638
David L. Mills	Linkabit	Mills@ISID	(703) 734-9000
Louis Schreier	SRI	Schreier@SRI-SPAM	(415) 326-6200
Philip Au	SRI	Psa@SRI-SPAM	(415) 326-6200
Greg Finn	ISI	Finn@ISIF	(213) 822-1511
Mike O'Connor	Linkabit	OConnor@DCN9	(703) 734-9000
Ray Tomlinson	BBN	Tomlinson@BBN	(617) 497-3363
Ginny Travers	BBN	Travers@BBN	(617) 497-2647
Terry Crowley	BBN	TCrowley@BBN	(617) 497-2677
Andy Poggio	SRI	Poggio@SRI-TSC	(415) 859-5094
Jose Garcia-Luna	SRI	Garcia@SRI-TSC	(415) 859-5647
George Robertson	BBN	GRobertson@BBN	(617) 497-3632